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Knossos Medical Faculty Site: Late Antique Graves and Other Remains - Appendix A: The Human Skeletal Remains

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CENTENNIAL VOLUME

KNOSSOS MEDICAL FACULTY SITE: LATE ANTIQUE GRAVES
AND OTHER REMAINS

REBECCA SWEETMAN (WITH CONTRIBUTION BY MARSHALL JOSEPH BECKER)

PAGES 331 - 386

APPENDIX A: THE HUMAN SKELETAL REMAINS, BY MARSHALL JOSEPH BECKER¹⁹³

INTRODUCTION

The 1978 rescue excavations at the Knossos Medical Faculty, undertaken by the British School at Athens, resulted in the recovery of a vast quantity of data in addition to 311 tombs representing several periods. The report presented below provides information on the 33 units given tomb numbers which were believed to relate to the Early Christian period (fifth–seventh centuries) and to be associated with the mortuary church and appended features.

Descriptions of the best-preserved skeletal material from these Christian tombs (e.g. Tomb 309) are not provided in full. The intact skulls in these instances have been left for Dr J. Musgrave to provide a detailed study of as part of a more comprehensive program of comparative research.¹⁹⁴ The majority of these thirty-three tombs appear to have been osteothekai containing collections of human skeletal remains. Either the remains in these chambers had been gathered up from some other place of primary deposit and secondarily placed in these chambers or later primary burials had disturbed the earlier interments. This analysis of the skeletal remains provides some pieces of information which shed light on how these chambers were used and who may have been placed within them.

During December 1981 I was able to initiate a preliminary study of these thirty-three tombs. This report is based on those data. The material from each tomb was examined to determine the numbers of individuals present and to elicit demographic data (age, gender) from each. The following record for each tomb begins with a brief statement regarding the conditions of recovery, each summarized from information provided by Mr Megaw and from field records. The analysis of the contents of each chamber represents a synopsis of the field notes.¹⁹⁵

THE SKELETAL DATA FROM THE TOMBS

Tombs 11 and 12

No human bone was recovered for analysis.

¹⁹³ *Acknowledgements*: I should like to thank A. H. S. Megaw, representing the British School at Athens and the Greek Government, for his kind invitation to assist in this research. Thanks also are due the following people for their aid in various aspects of this research: H. W. Catling, J. Carington Smith, A. Diserod, K. Kelley, J. A. MacGillivray, and Joseph L. Rife. Special thanks are due Dr Jonathan H. Musgrave for his continuing aid and encouragement in these many projects.

The research upon which this report is based was conducted with the aid of a small travel grant from West Chester University of Pennsylvania. The final report was prepared while I was a Fellow in Anthropology at The

University of Pennsylvania. The results of this programme as well as any errors of presentation or interpretation remain my sole responsibility.

¹⁹⁴ J. H. Musgrave and S. P. Evans, 'By strangers honor'd: a statistical study of ancient crania from Crete, Mainland Greece, Cyprus, Israel and Egypt', *Journal of Mediterranean Archaeology and Anthropology*, 1 (1980).

¹⁹⁵ M. J. Becker, 'Childhood among the Etruscans: mortuary programs at Tarquinia as indicators of the age of transition to "adult" status; or, when does life begin?', in A. Cohen and J. Rutter (eds), *Papers from the Dartmouth Conference* (Nov. 2003) (forthcoming).

Tomb 22: 9 individuals (7 adults, 2 children)

At least 9 individuals can be identified and the distribution suggests that others (children) could have been present.

Among the large bone fragments are the femoral remains of only 3 adults. However, 11 calcanei (of which 7 are rights) indicate the presence of at least 7 adults (4 females and 3 males by size estimate). Distal ends of a femur and humerus of a child aged 12-15 and the proximal end of a left femur of a child of 4 or 5 years of age provide the evidence for the two children. The single skull fragment (frontal and maxillary region) of an adult male indicates the absence of a palatine torus. All seven tooth-sockets show postmortem loss on this individual. No ante-mortem tooth loss is evident in the small collection of alveolar areas recovered from this tomb.

Two pathologies were noted. One is vertebral lipping along much of the vertebral column but without fusion. The second case is a right innominate with socket lipping, erosion, and apparent osteoporosis.

Tomb 151: 4 adults (male, female, 2 unknown) and 1 infant under 1 year

Located at the east end of the tomb was a collection of very dry, well-preserved bone which obviously had been relocated. The paucity of teeth and skull fragments indicate relocation or disturbance. As in the study of each of these commingled groups the observations of Snow and Folk (1970) were considered in the evaluations.

Three adults clearly are represented by tibiae, femura, calcanei, and patellae; and a fourth is suggested by extra femur fragments.

- (i) Adult male, stature 168.21 (based on a femur).¹⁹⁶
- (ii) Adult female, aged 50-2 (pubic symphysis fragment).¹⁹⁷
- (iii) Adult, female (?) (inferred from femur shaft fragments).
- (iv) Young adult (?), represented by a sacrum with incomplete fusion.
- (v) Child under one year, represented by a large collection of bones.

The well-represented presence of the child suggests that burial was made within this chamber. I doubt whether many of the small bones of an infant would have survived a transfer from another location.

Tomb 158: 7 individuals

The bones seemed arranged but no intact skull was found. Possibly the head(s) were to the east. Two well-articulated skeletons lying side by side were reported¹⁹⁸ and parts of at least 2 others. Details on sheet 195 show a relatively intact lower half of an adult (skeleton II) and at least two other persons who appear to have been moved aside to provide room for skeleton II.

No skeletal materials (e.g. mandibles) were found with green stains reflecting burial with a coin in the mouth, a custom noted from later Christian times in southern Italy and elsewhere.

In the analysis of this material extremely little cranial material was listed despite the presence of at least seven people in this chamber. Individuals (iii) through (vi) represented by femura.

¹⁹⁶ M. Trotter and G. C. Gleser, 'A re-evaluation of estimation of stature based on measurements of stature taken during life and of long bones after death', *American Journal of Physical Anthropology*, 16 (1958), 79-120 at 120.

¹⁹⁷ T. D. Stewart and M. Trotter (eds), *Basic Readings on the Identification of Human Skeletons: Estimation of Age* (New York, 1954), 241.

¹⁹⁸ KMF 21, 22.

- (i) Child aged 5 represented by a large number of its bones.
- (ii) Adult male nearly intact except for the right arm. Stature (femura) 171.55 cm.
- (iii) Adult female (?), stature 160.42 cm.
- (iv) Adult female.
- (v) Adult female (??), stature approximately 160 cm.
- (vi) Adult male, stature 166.33 cm. Third trochanters strongly marked.
- (vii) Infant 7-9 months (based on mandibular fragments).

Tomb 172: 3 adults (1 male, 1 female, 1?)

The material salvaged offers very little aid in evaluating this material. Neither cranial material nor teeth were recovered, nor a single vertebral element. However, at least 5 tibial shafts are represented indicating that no fewer than 3 adults were present. At least one pair derives from a robust male and another pair appears to be a small female. The fifth fragment is intermediate in size between the others.

Tomb 173: 1 adult, possibly female

The human remains recovered consist of 12 small pieces of adult bone, none of which are diagnostic. I suspect that a female is represented, but the evidence is insufficient to make a more specific statement.

Tombs 191, 194, and 199

No skeletal material.

Tomb 211: 3 adults (male 50; female 30-40; female c. 21)

This tomb was discovered in a very poor condition. Within it at least one extended individual lies with head to the west (articulated?). Pieces of skull and an extra humerus (?) appear at the west end. Leg bones appear to be neatly stacked at the east end.

The considerable collection of bone recovered was completely mixed. The femura provide the basis for identifying three separate people, but the same three are represented in the humeri. The femoral necks are extremely wide on these three and on most of the people in this sample.

- (i) Adult male, very robust, stature (left femur) of 170.63 cm, age c. 50. A strongly marked third trochanter is noted. The badly crushed skull of a male was noted. He had slightly shovelled central incisors and (at least) one strongly shovelled lateral.
- (ii) Adult female, stature (left tibia) 161.31 cm. Age 30-40 years.
A crushed skull with articulated mandible appears to belong to this individual.
- (iii) Young adult female, age c. 21.

Pathology: Of the 34 teeth found only one is carious and no ante-mortem loss can be demonstrated. The material, however, is too damaged to enable one to draw any conclusions. Individual (ii) (?) had a lumbar vertebra of irregular shape.

Tomb 223: at least 15 individuals: 14 children under 12 years of age, one adult

Some semi-articulated skulls were noted at the east end, which appeared to be the remains of several children. These were covered with stone, which may have fallen into the tomb at a late date. The excavator believes that these are actually the remains of burials and that this chamber was not used as an osteotheke.

The location of Tomb 223 near the central apse of the church leads one to suspect that the chamber may have had a function distinct from others in the area. A crypt associated with the church at Anemurium, Turkey¹⁹⁹ was found to contain the remains of at least 13 children under the age of 5 years. However, that crypt was situated at the end of the church opposite the apse, whereas the contents of this tomb at Knossos strongly suggest that the chamber served as a specialized burial vault.

The drawings indicate that this tomb contained at least one supine individual with a head to the west, possibly an articulated child who was the last person placed into this chamber. Many of the bones were numbered, but this was of little aid in reconstructing the population. Beneath skull 3 was an innominate and femur in articulation. The infused head of the femur suggests the age at death, but no other aspects of this person appear in the field notes. Skull 2 has the upper 3 cervical vertebrae in articulation suggesting a third articulated person placed in this chamber. These observations clearly indicate that this chamber was a place of primary burial. The remains of the children all appear to have been deposited after the remains of the adult. The reconstruction of this population, which included a great number of children, was most difficult. Only a summary of the individuals identified will be presented. Most of the children were identified on the basis of mandibular fragments, and additional individuals were noted when skeletal evidence suggested that still other people were represented by different bones.

Tomb 223

- (i) Child aged 5.2 (?) years based on skull fragments with maxilla, and mandible.
- (ii) Child aged 5 years.
- (iii) Child aged 6+ years.
- (iv) Child aged 11-12 years.
- (v) Child aged 6 years.
- (vi) Child aged 10-11 years.
- (vii) Child aged 9 years, female.
- (viii) Child aged 12 years, male.
- (ix) Adult, gender? (at least 8 teeth lost antemortem and others severely worn).
- (x) Child aged 7-8 years.
- (xi) Child aged 4.5-5 years.
- (xii) Child aged 2-2.5 years.
- (xiii) Child aged 12-14 months.
- (xiv) Child aged 7-8 months.
- (xv) Child under 12 months.

Observations on Tomb 223

The oldest child in this collection is only 12 years of age. This suggests that interment in a special chamber took place before puberty, and that a rite of passage at about 12 or 13 years of age was practised by these people when children became adults. The remains of a single adult (ix) are so sparse as to lead one to suspect that they may have been intrusive. The notable lack of children under one year of age suggests loss due to disturbance. Bilateral asymmetry in development of teeth appears regularly in these children; teeth on the left side generally developed slightly more rapidly than teeth on the right. No palatine torus was found on any of four maxillae. Some slightly shovelled central incisors and strangely shovelled laterals were observed, but other incisors of each category were found not to manifest this trait.

¹⁹⁹ M. J. Becker, 'An analysis of the human skeletal remains from Anemurium, Turkey', appendix to the excavation report of James Russell (1985), forthcoming.

Tomb 243: 8 individuals (6 adults, and 2 juveniles)

When found the contents were in disarray with only some skull fragments evident. A batch of material in storage labelled 'Tomb 243' appears to have been mislabelled. This was designated by Becker as '243a' and the remainder of the material was listed as '243b.' Most of a skull, and nearby a jaw, were found in the north-east corner, but generally the fill of this structure contained thoroughly mixed scraps of human bone. The jaw contains the teeth of a young adult.

The material designated as 'Tomb 234a' includes only a limited amount of bone which I suspect may relate to Tomb 246. The material consists of 15 small skull fragments and 3 pieces of tibia shaft, all of which seem to be an adult female. The material from Tomb 243 is badly damaged and quite compressed. Ten fragments of distal portions of humerus and 9 pieces of proximal ulna pieces appear to represent 5 individuals ranging from very robust to quite gracile. Five adult right mastoids are present, but six adults are represented by mandibles. The collection of 68 teeth was not studied.

A right zygomatic fragment and a right scapula, both of juveniles, could be from a single person but I believe that they are from 2 different age groups, one about 12 and one somewhat younger.

Tomb 244: 18(?) adults, 1(?) adolescent

Excavation proceeded by levels, not areas. Some 39 bags of bone were collected, each level producing from 2 to 15 bags. Some skulls were collected, but were found in extremely poor condition. These were left for future study. The long bones were found to be in extremely poor state of preservation. In attempting to calculate numbers no more than 5 individuals were indicated by skull or long bone pieces, except for the fibula, for which at least 8 people are represented. The patellae indicate at least 9 adults were present, but the calcanei indicate at least 16 and probably 18 adults were present, approximately equal in gender based on calcaneus size. We have good evidence for one adolescent (age 13-14 years), but can assume that more were present. Note that this adolescent is above the age of all of the children noted in Tomb 223.

The only intact bone in this series is an adult right radius (22.9 cm). The presence of foot, ankle, and lower leg fragments in abundance suggests that other long bones may have been removed to an ossuary while this chamber continued to serve as a locus for primary deposition of bone.

Tomb 245: Adult male, adult female, adult female (?)

The contents of this structure appear to have been extensively disrupted. Some 4 bags of bone were recovered from the fill. Two individuals, adult male and female, are extensively represented. A third person clearly is represented. Only a few fragments of skull are present and no evidence for age. All of these people may be over 30 years of age and more probably over 40 years, but no secure ages can be established.

Tomb 246: Mature adult male; adult female (?)

The human skeletal remains recovered are limited in scope. A large male and a second individual of smaller size are clearly present. The large calcaneus has exostoses suggesting an individual over 50 years of age. No mandibles or maxillae were found, reflecting the extent of damage to this chamber.

Tomb 254: At least 10 people are represented (7 adults, 3 children)

Some bones and pieces of skull were recovered from the western end, but other pieces of bone were located throughout the area. The crypt appears to be '1 burial wide' and not an osteotheke, in the evaluation of the excavator, but the presence of 10 people reflects a complex use of this crypt. The damage to the tomb was so severe as to leave us without a single intact long bone. Fragments

of 12 humeri, 6 mandibles, and 10 patellae indicate that at least 6 mature adults were present in this chamber. Fragments of the skull of 1 young adult (age 21-5) and pieces of 3 children (possible in the 12-15 age range) also were recovered. Three pubic symphyses were located, providing us with estimates of age for 3 of 6 mature adults. Each of these 3 is subject to considerable question but are estimated to be 40, 45, and 50 years respectively. Thus we have approximate ages for 7 of the 10 people in this sample.

Tomb 274: 2 adults, females (?)

One bag of bone was retrieved from the east end. At least one adult is represented clearly, and a second only on the basis of tibia shaft fragments. One of these is certainly a female, and the other also appears to be a small individual, probably female but possibly a small male.

Tomb 296: 4 adults (3 females and 1 male) and a child of 9 years

Three skulls were found on the west end and labelled 1, 2, and 3 (from south-west to north-east). A fourth skull was reported, as were other post-cranial bones of which 5 bags were found in storage along with 4 bags of skulls. In addition to the 4 skulls recovery of 5 innominates representing 4 people provides evidence for 4 adults. The innominates suggest that 3 of these adults were female. Four mandibles are also represented. The individuals are as follows:

- (i) Rear of brain case of (non-reconstructable) skull.
- (ii) Most of a skull (may be reconstructable).
- (iii) Portions of a skull.
- (iv) Fragments of a mature adult skull, portions of which might be reconstructable.
- (v) Child aged 9 years. This is a case of a child, represented by a nearly complete skeleton, being buried with adults.

Tomb 297: Adult male and female

The only bones remaining were those of the lower legs and feet, found on the east end of the chamber. The fragmentary remains of the legs of two people, an adult female (?) and adult male, were studied. One set of bones was far more broken than the other. This suggests that the first person interred had been pushed aside to make room for the subsequent burial.

Tomb 298: 1 adult, female (?). Possible cremation?

A long bone and some bone scraps were the only materials found within the chamber. Most of these fragments appear to have been cremated, but not in a high temperature fire. Only one person represented, and the small size of the distal end of a left humerus suggests a female.

Tomb 299: Adult male and female

The bones in the south half, although in poor condition, suggested this was an osteotheke and not a single grave. The bones recovered represent 2 adults, male and female, in a relatively poor state of preservation. Unfortunately, only a few cranial fragments and 3 loose teeth survived and nothing more specific can be said.

Tomb 300: Adult male (age 50+), female and indeterminate third adult

The bones appear pushed to one side, either when the tomb was robbed or when subsequent burials (primary) were placed in the chamber. Two individuals are fairly well represented. One is a

male for whom we have a reconstructable calotte. His age is over 50 years. Pieces of a female also are evident, but fragments of femur provide clear indication of the presence of a third person. No vertebrae, ribs, hands, or feet are represented suggesting that either collection of remains ignored these items or this crypt served for secondary burials.

Tomb 302

No human remains recovered.

Tomb 305: Adult female

A bag of bone was salvaged from the site along with a bag of sherds. The 9 fragments of bone appear to reflect a small adult female.

Tomb 309: 5 adults (3 female, 2 male) and 1 child aged 4-5

This tomb was the only intact Christian tomb located during this rescue operation. A large mass of bone was found stacked at the east end. A skull (female no. 3?) and some articulated bones suggest that the last person interred may have been a woman. Three other skulls (1, 2, 4) and an assortment of bones were numbered before removal. The only intact skull and mandible are no. 1, found near the centre of the north side. In general previous burials seem to have been made by entering from the south end and pushing skulls to the left (west) and long bones to the right (east).

The 11 proximal ends of adult tibiae provide evidence for at least 5 people (and a suspected sixth). These are listed as (i)-(v) below and associated with other remains found in this tomb in a composite picture.

- (i) Adult female, stature 154.99 cm. This may be the female whose age is calculated at 60+ years on the basis of the pubic symphysis.
- (ii) Adult female age 20-1 years. Stature (tibia and humerus) 157.1 cm. A sacral fragment found beneath the floor may belong to this woman.
- (iii) Adult male (??), stature 164.43 cm.
- (iv) Adult male, stature 173.39 cm. Age 50+ based on pubic symphysis.
- (v) Adult female, stature (femur plus tibia) 152.90 cm. Bone S (right humerus) provides a very similar stature estimate of 153.53 cm.
- (vi) Child aged 4-5 years. Represented by skull fragments only.

Several intact or nearly intact skulls were recovered from Tomb 309. These were not examined in this program but left for Dr J. H. Musgrave to include in his more comprehensive program of craniometric study. At this point a tentative assignment of skulls to the post-cranial material noted above can be made.

Skull 1: perfectly intact skull, possibly from person (iv).

Skull 2: an intact mandible of a person of age about 20, based on tooth wear. The extensive periodontal problems suggest an older person with a bland (luxury) diet. Possibly person (ii).

Skull 3: A mix of bones including most of three skulls and a piece of a fourth (see Skull 4).

Child aged 5, almost certainly person (vi), above.

Adult aged c. 17. Possibly person (iii), but very uncertain.

Young adult skull, possibly; reconstructable. Is this person (v)?

Skull 4: Fragments of an adult skull. The calotte may be restorable. Pieces of the mandible and maxilla of an older person. Possibly person (i).

Pathologies and anomalies:

- A. Corpus sternum with the greatest anterior-posterior curvature that I have ever seen.
- B. Vertebral body tipping and exostoses, probably of one or both of the older people (i and iv).
- C. An example of sacroiliac fusion.
- D. The mandible of Skull 2 has unusually severe periodontal problems.

Tomb 311: 12 adults, 1 late adolescent (aged c. 16), and c. 20 children (aged 0-15.5 years)

In this east-west oriented built tomb bones were found (Sheet 347: plan at 1:10) which suggest that a roughly articulated skeleton occupied the chamber, possibly slightly disturbed by animal activities. Two skulls appear in the drawing but in an uncertain relationship. A buckle was found beneath a 'layer' of children's bones, and other well preserved skeletal remains were recovered. The outstanding preservation of these bones (but including only 2 reconstructable skulls, see below, which were assigned to Dr Musgrave) and the limited time available for analysis resulted in a set of conclusions which are tentative at best. At least 11 adults (probably 13) are represented on the basis of a tabulation of proximal ends of right femura. Since evidence from the distal ends of left humeri also indicates 12 adults and one late adolescent (aged 15-17?), for a total of 13 people, I believe we can safely estimate the population as including 12 adults and one late adolescent in addition to a very large number of children. Approximately 20 children below the age of 15 (from 0-15.5 years) are represented and a detailed comparative study of their bones should be undertaken. For the purposes of our tables (see TABLE 2) these are here distributed evenly among the first 4 age categories.

The correlation between a well-preserved tomb and a large collection of infant and children's bones is expected. High infant mortality rates, which exist in all societies, appear in the archaeological record only when skeletal preservation is outstanding. However, this mix of adults and children suggests that tomb 223 with only children may be an unusual situation.

The relative absence of skull or jaw fragments other than the 2 intact skulls noted above is of interest. Given the fine preservation of this material one would expect an outstanding collection of skulls. Only the fragments from the skulls of infants were common while only 1 or 2 adult skull fragments were noted. Except for 2 skulls and a fragmentary mandible included with 'bones fallen from cut' of trench, adult skulls and mandibles are absent from this collection. Only a cultural activity could account for the discrepancy. Either skulls were removed from this burial chamber or, less likely, left behind when bones were placed in this tomb. Quite possibly earlier burials were moved aside when new arrivals came and their skulls were removed.

The only pathology noted is a deformity of the proximal end of a left femur. The identity of the pathological condition or its aetiology is not known.

ADDITIONAL BONE LOTS: BASILICA BONES

Lot I: KMF'78 14/4/78

A small lot of human bones from east of the south end of the 'Stylobate wall' includes a piece of metacarpal (?) and a right mandibular fragment. The dentition associated with this jaw manifests a high disease rate, quite different from any of the material listed above.

Lot II: KMF'78 19/4/78: Area of Marble Sarcophagus

All of this bone which I can identify is animal. None is clearly recognized as human bone.

Lot III: KMF'78 6/9/78: 3 adults and 1 child

This is an odd collection with fair preservation but lacking leg bones. Included in the collection is evidence for one adult female aged 45 (pubic bone), a second adult (male?) and a person aged 18–20 years old. Not one bone is unbroken and none could be restored. A child aged 8–10 years of age is represented by 4 bones.

Lot IV: KMF'78 6/6/78

Three adults and one infant found in a Chamber within south-west corner of Church Boundary Wall. Like Lot III, leg bones not represented, except for a single piece of a right femur. Two calottes, possibly reconstructable, are present. One probably male. The infant, based on femur size, probably under 8 months old.

POPULATION DISTRIBUTION

AGE (see TABLE 1)

In general the mortality curve based on the people represented in these tombs shows that infants and children are greatly underrepresented. Either the remains of sub-adults were interred in special chambers, such as Tomb 223, or lack of preservation (or recovery) distorts our understanding. The distribution of individuals in Tomb 311 appears close to that which would be expected in a normal population, but Tomb 311 enjoyed unusual preservation. Tomb 20 provides a clear example of the problems of decay and poor preservation. From Tomb 20 we have only minimal evidence for each of the 9 people recognized. When boneless levels are this extensive the loss of fragile remains of children is disproportionately higher than loss among adult remains.

The age distribution figures (TABLE 1) reflect major variations from all known population curves expected from populations of this size. These factors are noted below with an explanation for each.

Infant mortality appears to be low. This may reflect differential burial for children below the age of 15.5 years (see T311).

Mortality in the 16–25 age slots is unusually low. This interval usually is marked by a very high female morbidity due to factors relating to childbirth.²⁰⁰ The anomaly in this situation at Knossos may reflect one of two factors:

- (i) Women dying in childbirth may have been buried in association with a special church or otherwise removed from normal cemetery activity, a situation which appears to have existed at Byzantine Anemurian.²⁰¹
- (ii) Many women dying in this age category may have been evaluated as 'adults' see (TABLES 1 and 2) and distributed throughout the categories 21–50, thus distorting what may have been a very high rate in the 21–5 age group.

The high point for a mortality curve would be expected to be at a later age than is apparent in TABLE 1. This probably reflects the distribution noted above. Were more precise

²⁰⁰ Id., 'Etruscan women at Tarquinia: skeletal evidence for tomb use', *Analecta Romana*, forthcoming.

²⁰¹ Id., 'Mandibular symphysis (medial suture) closure

in modern *Homo sapiens*: preliminary evidence from archaeological populations', *American Journal of Physical Anthropology*, 69 (1986), 499–501.

TABLE 1. Age distribution^a

Ages	Female	Unknown	Male	Totals
0-1		10		10
2-5		12		12
6-10		11		11
11-15		15	1	16
16-20	1	2	—	3
21-25	13	4	4	21
26-30	8	1	6	15
31-40	14	2	14	30
41-50	13	2	14	29
51-60	1	—	3	4
60+	2	—	—	2
	52	59	42	153

^a The adults listed in the text for whom a specific age is not given were assigned an age to construct this table. By evenly distributing them among the 4 adult categories from age 21 to 50 we count a total of 36 males, 44 females and 7 sex-unknown adults. In each case where sex was assigned but not identified securely in the text the assignment here was in that sex category suspected.

evidence on the age of death available, this curve would probably correspond more closely to a 'normal' curve.

The decision to refrain from the use of dental wear as an indicator of age derives more from the lack of intact dentition (or 'faces') than from the problems derived from such techniques.²⁰² The difficulties involved in the recovery of these remains and their fragmentary nature dictate that we proceed with the utmost caution in reaching any conclusions regarding the mortality curve for this population. Rough data such as appear in TABLE 3 perhaps provide a more reliable basis upon which to discuss this population.

SEX

Despite the poor condition of much of this material every attempt was made to assign sex if at all probable. The summaries of each tomb provide detailed evaluation while the tables (1 and 3) gloss over the degree of uncertainty which actually exists. Of the 103 adult (over the age of 20) individuals, 40 have been identified as within the likely male range and 53 within the female range. Quite probably some of the gracile males have been erroneously assigned. As noted above young adult females may have been buried in special and removed circumstances. This also may be the case for high status males, clerics, etc. Of interest is that the ratio of 53/41 in this sample is nearly identical with the 12/9 ratio found by Musgrave for gender assigned adults in his group.²⁰³

²⁰² J. H. Musgrave, 'Appendix A: the human skeletal remains', in H. W. Catling and D. Smyth, 'An Early Christian osteotheke at Knossos', *BSA* 71 (1976), 25-47

at 40-6 (40-1).

²⁰³ Ibid.

STATURE

The formulae for calculating stature computed by Trotter and Gleser²⁰⁴ were applied to all of these individual bones (TABLE 2). The specific bones used are noted in each description. The numbers of individuals evaluated are smaller (note that Tomb 311 has *not* been included) but the figures are quite similar to those provided by Musgrave.²⁰⁵ KMF '78 males are a bit shorter, and the females a bit taller than those evaluated by Musgrave. The females of KMF '78 may appear taller perhaps as a function of the formulae chosen for evaluation. However, the range for each group is under 10 cm and no overlap was found. This suggests that the total population used is too small to provide data suitable for comparisons.

TABLE 2. Stature (in cms) by sex^a

Stature	Females (6) by Tomb	Stature	Males (7) by Tomb
152.90	158: iii	164.43	309: iii
154.99	309: i	166.33	158: vi
157.10	109: ii	168.21	151: i
160.00	158: v	170.58	236
160.42	158: iii	170.63	211: i
161.31	211: ii	171.55	158: ii
		173.39	309: iv

^a Tomb 311, which held the well-preserved remains of at least 12 adults, was not tabulated with this collection. The skeletal material from that tomb would nearly double the number of individuals in each list above.

MULTIPLE BURIALS

It is uncertain if those crypts with large numbers of individuals represented contained members of the community at large or only of a single family. Certainly the large numbers of chambers including 2 or 3 adults only may have been tombs for a husband and wife, and perhaps another member of the immediate family. However, without the most careful excavation little can be said regarding these problems and even with excellent recovery²⁰⁶ the interpretations are seldom simple.²⁰⁷ Noted in the field books are the shapes of several tombs (e.g. 158, 254, and 274) as being only wide enough for one person. Yet the remains of 7, 10, and 2 individuals respectively were recovered from these small chambers. Thus little can be understood through examination of this limited sample.

²⁰⁴ see n. 196.

²⁰⁵ Musgrave (n. 202), 41.

²⁰⁶ Catling and Smyth (n. 202), 25-39.

²⁰⁷ Musgrave (n. 202).

Particular attention might be given to the high incidence of tombs (TABLE 3), from which there is evidence for only 1 adult male and 2 or 3 adult females. Quite commonly the male and one female are mature adults while the other female is a young adult. Two possible explanations might be offered. One, older males may have taken secondary (young) wives, many of whom may have died in childbirth (primipara). A second possibility is that a young female who was married outside the kin group but who died in childbirth (or before delivering a viable child) was not considered as a member of her 'husband's' kin group. Her body may have been returned to her parents, who placed the remains in a family tomb. This latter interpretation must be considered as more likely since it would be consistent with known kinship ties and responsibilities. Furthermore, the frequency of secondary (multiple) marriages would never be so high as 25% in any population since the ratio of males to females is almost always very close to 1 to 1.

TABLE 3. Numbers of individuals in each tomb.

Tomb	0-19M	Children		Adults		?	Total no. of Individuals
		F	?	M	F		
11							0
12							0
20				1			1
22		2		3	4		9
32				1			1
145	(pit)	1		1			2
151		1		1	1	2	5
158		2		2	3		7
172				1	1	1	3
173						1	1
191							0
194							0
199							0
211				1	2		3
223	1	1	12			1	15
236 (pit)				1			1
243			2	3?	3?		8
244		1		9?	9?		19
245				1	2		3
246				1	1		2
254		3		3?	4?		10
274				2?			2
296		1		1	3		5
297				1	1		2
298				1?			1
299				1	1		2
300				1	1	1	3
301				1			1
302							0
305				1			1
309		1		2	3		6
311		21?		6?	6?		33?
Lot III				1?	1	1	
Lot IV		1		1			4
TOTALS	1	1	48	41	53	9	153

PATHOLOGIES AND ANOMALIES

This study of the extremely fragmentary remains focused on age and sex and not on recording many of the features tabulated by Musgrave.²⁰⁸ Of interest is the regularity with which wide femoral necks were observed, and third trochanters also are common as are bipartite ('notched') patellae. Third molar agenesis and other dental features, as noted above, were noted but minimally due to the condition of the material. Interesting bilateral asymmetry in dental eruption time appears regular. No mandibular tori were observed, or palatine tori. Few abscesses and few caries were noted, but these features could be recorded only in the few cases where relatively intact faces were found. Osteoarthritis was common, the pattern describing the same characteristics by Musgrave.²⁰⁹ However, no X-rays were taken so that his data derived from that technique cannot be confirmed for this population.

COMPARATIVE DATA

The craniometric data gathered by Musgrave will include information available from the few skulls, either intact or restorable, from this population. These data will permit important conclusions to be drawn regarding population change and movement in interest regarding this period is the observation review of a 7th-century (Byzantine) population of suggests that they are relatively dolichocephalic. If they are typical of the population of the Peloponnesus of that period we might consider both how they compare with the Cretan population of the same general point in time, with earlier Greeks, and with the more round-headed population now typical of the area. We know that this single trait (ratio of head width to length) is but one of a constellation of features which describe the human skull. Demonstrating that this feature changed or remained stable relative to the many traits that Professor Musgrave will study may tell us a great deal about these ancient peoples.

From this immediate area at Knossos we have the skeletons from the c. 100 Early Iron Age tombs,²¹⁰ but these are similarly fragmentary and also date from 1,000 years before the population examined here. Musgrave's study of an Early Christian osteotheke from Knossos,²¹¹ with up to 50 individuals of all ages, reveals an equally fragmentary skeletal sample. Rife examined 63 individuals from the cemetery of a prosperous community at Isthmia that spanned the Roman to Byzantine era.²¹² Although the time-span is great, individuals commonly were found buried together in what Professor Musgrave believes to be family graves. He considered Early Christian basilica cemeteries, and the complete publication will be of note.

Of particular interest are the results from a preliminary study of Early Christian Greeks from Nemea.²¹³ Comparative data on Christian period burials is not abundant. I have studied numerous Early Christian and Medieval tombs in Peninsular Italy and also from

²⁰⁸ Ibid.

²⁰⁹ Ibid.

²¹⁰ J. H. Musgrave, 'The human bones', in J. N. Coldstream and H. W. Catling (eds), *Knossos North Cemetery Early Greek Tombs*, 4 vols. (BSA Supp. 28; London, 1996), ii. 692.

²¹¹ See n. 202.

²¹² J. L. Rife, 'Roman and Byzantine mortuary practices in rural Greece: the case of Isthmia', *AJA* 102 (1998), 382.

²¹³ M. J. Becker, 'The Classical and Early Christian populations at Nemea, Greece: skeletal analysis', forthcoming.

along the Via Gabina to the east of Rome²¹⁴ as well as southern Turkey.²¹⁵ A compendium of all the published skeletal studies from Sicily²¹⁶ reflects the limited attention directed to the Byzantine period. More relevant to the Knossos population is the comparative material from Halieis now being studied and the related Christian material from Nemea scheduled for study in the near future.

Also of interest is a study of modern Cretans²¹⁷ which was derived from Hawes's original work done near the beginning of the last century. The last modern population studied (c. 1900) is separated from the Early Christian population (AD 400–500) by over 1400 years, which is less than separates these Christians from the Late Minoans of 1400–1200 BC. For studies of microevolutionary change these data might be useful.

A FINAL OBSERVATION

The wide variation in the numbers of individuals identified in each of these tombs (TABLE 3) is of great interest. Only one tomb, no. 311, contained a comparable number to the 35 on whom Musgrave reports.²¹⁸ He indicates that adults were in the majority while in Tomb 311 they are a distinct minority. Apart from the 19 individuals from Tomb 244 no other chamber in our sample comes close to that excavated in 1974.²¹⁹ In fact, the 14 children (and one adult) from Tomb 223 suggests a special function chamber.

The range of differences in the human contents of many of these tombs, when compared among themselves or with the tomb excavated in 1974 at Fortetsa, which has served above for comparison, suggests that considerable disparity exists. From this we must conclude that no single significance in use or function can be assigned to these chambers, even excluding the two pits. These burials contained the remains of the entire community. The many tombs recovered here, with their individual variations in numbers as well as sex- and age-distributions, offer evidence for cultural organization. What that organization may have been, may be extracted from combining all the sets of available evidence, but certainly differences in time and variety in contemporary cultural practices must be considered as a basis for interpreting this diverse range of information.

²¹⁴ Id., 'An analysis of the human skeletal remains of the Byzantine period from the church of San Pietro, Otranto (OSP)', *Otranto: ricerche archeologiche a S. Pietro. Le aree omogenee della civiltà rupestre nell'ambito dell'Impero bizantino: La Cappadocia* (Galatina; 1981), 231–3. M. J. Becker, 'Human skeletons from a medieval context at San Foca (Puglia), Italy: Byzantine tombs of the 12th century', *Old World Archaeology Newsletter*, 18 (1) (1994), 9–11; id., 'The Medieval population of "Satricum", Borgo Le Ferriere (Lazio), Italy: biological evidence for cultural continuities', *Archeologia Medievale*, 25 (1998), 369–73; id., 'Late Roman skeletons from tombs of the

5th century CE at Metaponto (Basilicata) Italy', *Archaeological News*, 23 (2000), 57–68.

²¹⁵ See n. 199.

²¹⁶ M. J. Becker, 'The people of Sicily: studies of human skeletal remains and of human biology from the Paleolithic to modern times', *Rivista di antropologia* (Rome), 80 (2002), 1–120.

²¹⁷ D. F. Roberts, 'The Cretans: a geographical analysis of some aspects of their physical anthropology', *The Journal of the Royal Anthropological Institute*, 84 (1954), 1–13.

²¹⁸ See Musgrave (n. 202), 40.

²¹⁹ Ibid., 14.